



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/965,408

09/25/2001

Eliezer Rosengaus

P632

3796

7590

06/29/2004

Kevin McAndrews
Bldg. D
160 Rio Robles
San Jose, CA 95134

EXAMINER

ROSENBERGER, RICHARD A

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/965,408

Applicant(s)

ROSENGAUS ET AL.

Examiner

Richard A Rosenberg

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 13-41, 81-114 and 116-119 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-41, 81-114 and 116-119 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5/6/04, 5/17/04</u> | 6) <input type="checkbox"/> Other: _____ |

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-11, 13-41 and 81-114, and 116-119 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yonezawa (US 6,222,624) in view of Morioka et al (US 5,274,434), Miura et al (US 5,585,916), Eytan et al (US 6,496,256), and Antonelli et al (US 6,259,108).

Yonezawa shows that it is known in the art to inspect wafers (8; column 6, line 42) having repeatable patterns thereon (abstract, line 4) by obtaining images of the patterns on the wafer, obtaining both bright field images (column 7, lines 12-13) and dark field images (column 7, lines 18-19).

Yonezawa does not show using "a contact image sensor" to obtain the image of the wafer. As shown by Morioka et al, it is known in the art that images can be obtained from a patterned wafer (111) using such a sensor comprising an array of lenses (503) and a detector array (505). Morioka et al teaches that the such imaging systems are known in the art for obtaining images, stating that they have been used for "facsimiles, electronic copying machines, and so forth" (column 16, lines 57-58); that reference adds to the teaching of the art that the system can usefully obtain

images (filtered by the Fourier filters, but images none the less) in the context of, and with sufficient resolution for, testing patterned wafers.

Miura et al also uses such an lens array (7a) to image the surface of the object onto detector array (8a) (column 4, lines 40-44) to obtain an image for inspection of the object. Miura et al explicitly claims that the inspection system of that patent can be used to inspect patterned surfaces (claims 11 and 15 of the reference); recognizing and teaching that such sensors are useful in inspecting patterned surfaces.

Antonelli et al also teaches that is it known to us an array of rod lenses (3) to image an object, which demonstrates, along with Morioka and Miura, the known use of the imaging system. Antonelli et al characterized such a system as providing "high resolution" (column 2, line 55).

It would have been obvious to use the image obtaining systems such as shown by Morioka et al, Miura et al and Antonelli et al to obtain the images of patterned wafers for the sort of inspection shown by Yonezawa because it is a known manner of obtaining such images and, as taught by Morioka et al (abstract, line 20; column 16, line 58-60) and Antonelli et al (column 2, line 53), produces a smaller, more compact unit (abstract, line 20; column 16, line 58-60).

Yonezawa teaches both bright field and dark filed measurements, but makes the two sequentially using two light sources and a single detection system. It is known in the art that measurement can be made simultaneously at two different

angle by providing a single light source and two detection systems arranged at appropriate angles for the desired detections; see figure 8 of Eytan et al, which shows this. Note the Eytan teaches providing optical elements to properly focus the light (column 5, lines 50-52) in the light paths. It would have been obvious to obtain both the bright field and dark field images taught by Yonezawa by placing imaging systems as shown by Morioka and Miura et al at two different angles, one for bright field and another for dark field imaging. This would reduce the time necessary for obtaining the two images and eliminate a second scan of the wafer though the system such as shown by Morioka and Miura et al.

In a similar arrangement using a contact sensor with an array of rod lenses, Antonelli et al teaches that an appropriate light source is an array of light emitting diodes (column 5, line 4); the use of this light source other known solid state light sources in such a linear array in the inspection system such as shown by Miura et al would have been obvious. Antonelli et al shows that it is known in the art to integrate the rod lenses, detector array and at least a portion of the light source optics into a package.

3. The remarks filed 5 April 2004 argue that the references previously applied did not teach a contact image sensor configured to acquire an images of repeatable pattern features on a wafer. It is known in the art to so obtain the images; see the instant specification, the paragraph bridging pages 5 and 6, and Yonezawa. It is

known that such contact sensors can be used to obtain images while providing a small, compact instrument, and it is known to do so for the purposes of making measurements. As set forth above, the use of the contact imaging systems for their known purposes of obtaining images in a context, article inspection, in which they are known to be used and be useful, as shown by Morioka and Miura et al, would have been obvious.

It is of course correct that none of the references individually teach exactly what is claimed; neither this nor the previous rejection was based upon any allegation that they did so. Morioka uses such sensors to obtain images of patterned wafers; the fact that that reference teaches that the images can be used in a somewhat different test does not remove from the art the knowledge that such sensor arrangements obtain images, and teaches the general usefulness of such sensors for testing patterned wafers. There is no teaching or suggestion in Miura that the sensor arrangement can image light only from unpatterned surfaces; indeed, the reference itself claims using them with patterned surfaces. Eytan et al is cited to show it is known that light from a surface being tested at two different angles can be detected by providing two appropriately positioned detection systems, which it does show. That Antonelli et al uses the system to image a fingerprint pattern does not teach or suggest that such a system is limited to detection of fingerprint patterns.

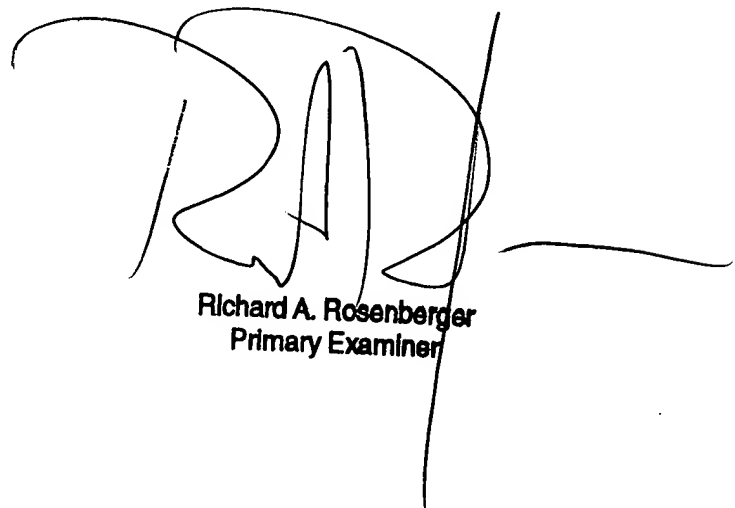
4. On the information disclosure form filed 6 May 2004, cite number 44 has not been considered and has been lined through because the patent number and the listed inventor do not match and it is unclear what the correct cite is intended to be.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A Rosenberger whose telephone number is (571) 272-2428. The examiner can normally be reached on Monday through Friday during the hours of 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. A. Rosenberger
25 June 2004



Richard A. Rosenberger
Primary Examiner